Space Weather Forecast

Issued on Saturday, 17 December 2022 at 12:34 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Further Moderate class flares likely from the Active sunspot in the southwest.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar Activity has been Moderate with two M-class flares observed during the past 24 hours, both from the large region approaching the southwest limb. There are seven other sunspot regions on the visible disc. The newly numbered region on the northeast limb has been responsible for several coronal mass ejections in recent days and is likely just the leader of a larger, more complex active region. The remaining regions on the disc are relatively small, weak and magnetically simple.
Solar Wind / Geomagnetic Activity: Solar winds have been at slow-ambient levels. The total Interplanetary Magnetic Field was weak. The north-south component varied between weakly positive and negative. Geomagnetic activity was Quiet (Kp 0-2).
Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) has persisted at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to continue at Moderate levels, with further Moderate flares likely especially from the active sunspot in the southwest. There is a slight chance of rising to High with the potential for an isolated Strong flare.
Solar Wind / Geomagnetic Activity: Two coronal mass ejections may give slight glancing impacts between 18th and 19th. Solar winds are expected to be at slow-ambient levels initially, perhaps becoming slightly elevated day 2 (18th) from the high speed stream from coronal hole 54. The aforementioned coronal mass ejections may also combine with the coronal hole high speed stream arrivals, or give separate glancing impacts spread between days 2 and 3 (18th and 19th). The high speed stream from coronal hole 55 may then arrive from late day 4 (20th) or perhaps more likely after, likely bringing enhanced solar wind speeds toward the end of the period or beyond.
Quiet geomagnetic activity (Kp 0-2) is expected, with a chance of becoming Unsettled to Active (Kp 3-4), with a very slight chance of G1/Minor Storms (Kp 5) days 2-4 (18th-20th) due to a combination of high speed streams and glancing coronal mass ejections.
Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to persist at background, however this has a slight chance of rising in response to any notable flares that occur, perhaps exceeding the S1/Minor Storm level.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	20	20	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	80	80	60	40
Very Active	R3 to R5 X	No	15	15	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	15	15	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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